

BKL Annotation details of one docket matching protein

Human SNAI1 Snail 1 (Drosophila) homolog, a zinc-finger transcriptional repressor, represses expression of E-cadherin (CDH1) and aromatase (CYP19), may play a role in carcinoma and melanoma progression by repressing CDH1

Disease

Therapeutic Target:

decreased expression of SNAI1 mRNA may prevent abnormal cell differentiation associated with Carcinoma 2000 (10655587)

Diagnostic Marker:

decreased expression of SNAI1 mRNA may correlate with Breast Neoplasms 2001 (11245431)
increased expression of SNAI1 protein correlates with breast ductal carcinoma associated with Breast Neoplasms 2002 (12082640)
increased expression of SNAI1 protein correlates with breast ductal carcinoma 2002 (12082640)
increased expression of SNAI1 mRNA may correlate with increased negative regulation of transcription from Pol II promoter associated with Melanoma 2001 (11323412)
increased expression of SNAI1 mRNA may correlate with malignant form of Melanoma 2001 (11323412)

Negative Correlation:

SNAI1 gene does not correlate with Craniosynostoses 1999 (10585766) 1999 (10543399)

Phenotype

**Title line
phrases**

Membership:

contains an N-terminal SNAG domain 2003 (12579345)
member of the SNAG zinc finger protein subfamily of zinc finger proteins 2003 (12579345)

Biological Process/Role:

represses expression of E-cadherin (CDH1) 2000 (10655587)
represses expression of aromatase (CYP19) 2001 (11245431)

Role in Disease:

involved in tumor progression 2000 (10655587)
upregulated in melanoma cells 2001 (11323412)
expression inversely correlates with the grade of differentiation of breast carcinoma 2002 (12082640)
downregulated in breast cancer cell lines 2001 (11245431)

Synonyms

SNA
SLUGH2
SNAH
dJ710H13.1

Cognate

Mouse Snail *

members Rat Snail

GO

GO ontology: transcriptional repressor activity *Experimental (E) 2001 (11245431)*
 GO ontology: specific transcriptional repressor activity *Experimental (E) 2000 (10655587)*
 GO ontology: specific transcriptional repressor activity *Experimental (E) 2000 (10655586)*
 GO ontology: DNA binding *Experimental (E) 2001 (11245431)*
 GO ontology: cartilage condensation *Unspecified Evidence (?) 1992 (1295727)*
 GO ontology: neurogenesis *Unspecified Evidence (?) 1992 (1295727)*
 GO ontology: negative regulation of transcription from Pol II promoter *Experimental (E) 2001 (11245431)*
 GO ontology: negative regulation of transcription from Pol II promoter *Experimental (E) 2000 (10655587)*
 GO ontology: mesoderm cell fate determination *Unspecified Evidence (?) 1992 (1295727)*
 GO ontology: mesoderm cell fate determination *Unspecified Evidence (?) 1992 (1483390)*

Expression

Body: mammary gland/breast * Cell types: fibroblasts * Cell origin: cell line * Techniques: rt-PCR *Experimental (E) 2001 (11245431)*
 Body: lung * developmental stage: adult * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Body: liver * developmental stage: adult * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Body: mammary gland/breast * Tumors: tumor * Cell origin: cell line * Regulation: downregulated * Techniques: rt-PCR *Experimental (E) 2001 (11245431)*
 Body: skeletal muscle * developmental stage: adult * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Body: placenta * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Cell origin: cell line * Techniques: in situ hybridization * Tumors: melanoma *Experimental (E) 2000 (10655586)*
 Cell origin: cell line * Techniques: Northern analysis * Tumors: tumor *Experimental (E) 2000 (10655587)*
 Cell origin: cell line * Cell types: fibroblasts * Techniques: Northern analysis *Experimental (E) 2000 (10655587)*
 Body: brain * developmental stage: adult * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Body: heart * developmental stage: adult * Techniques: Northern analysis *Experimental (E) 1999 (10585766)*
 Tumors: carcinoma * Cell origin: cell line * Techniques: in situ hybridization * Body: mammary gland/breast *Experimental (E) 2000 (10655586)*
 Cell origin: cell line * Tumors: melanoma * Techniques: rt-PCR *Experimental (E) 2000 (10655586)*

Tumors: carcinoma * Cell origin: cell line * Body: mammary gland/breast *
 Techniques: rt-PCR *Experimental (E) 2000* ([10655586](#))
 Cell types: fibroblasts * Cell origin: primary cells in culture * Techniques: rt-PCR *
 Body: skin *Experimental (E) 2001* ([11323412](#))
 Cell types: melanocytes * Degree: not * Cell origin: primary cells in culture *
 Techniques: rt-PCR *Experimental (E) 2001* ([11323412](#))
 Cell origin: cell line * Tumors: melanoma * Techniques: rt-PCR * Regulation:
 upregulated *Experimental (E) 2001* ([11323412](#))
 Body: kidney * developmental stage: embryo-fetus * Techniques: Northern analysis
Experimental (E) 1999 ([10543399](#))
 developmental stage: embryo-fetus * Techniques: Northern analysis * Misc. Organ/Cell
 Type: several tissues *Experimental (E) 1999* ([10543399](#))
 Body: mammary gland/breast * Cell types: epithelium/epithelial cells * Cell origin: cell
 line * Techniques: rt-PCR *Experimental (E) 2001* ([11245431](#))

- References**
- Correlation of Snail expression with histological grade and lymph node status in breast carcinomas.** BLANCO, MJ; MORENO-BUENO, G; SARRIO, D; LOCASCIO, A; CANO, A; PALACIOS, J; NIETO, MA // CSIC & Ctr Nacl Invest Oncol & Univ Autonoma Madrid: Oncogene 2002 May 9;21(20):3241-6. ([12082640](#))
- Cloning and developmental expression of Sna, a murine homologue of the Drosophila snail gene.** NIETO, MA; BENNETT, MF; SARGENT, MG; WILKINSON, DG // NATL INST MED RES: Development 1992 Sep;116(1):227-37 ([1483390](#))
- Isolation of Sna, a mouse gene homologous to the Drosophila genes snail and escargot: its expression pattern suggests multiple roles during postimplantation development [published erratum appears in Development 1993 Mar;117(3):preceding table of contents]** SMITH, DE; DELAMO, FF; GRIDLEY, T // ROCHE RES CTR: Development 1992 Dec;116(4):1033-9 ([1295727](#))
- Characterisation of the human snail (SNAI1) gene and exclusion as a major disease gene in craniosynostosis.** TWIGG, SRF; WILKIE, AOM // John Radcliffe Hosp: Hum Genet 1999 Oct;105(4):320-6 ([10543399](#))
- Genomic organization, expression, and chromosome location of the human SNAIL gene (SNAI1) and a related processed pseudogene (SNAI1P).** PAZNEKAS, WA; OKAJIMA, K; SCHERTZER, M; WOOD, S; JABS, EW // Johns Hopkins Hosp & Johns Hopkins Univ & Univ British Columbia: Genomics 1999 Nov 15;62(1):42-9 ([10585766](#))
- Down-regulation of promoter 1.3 activity of the human aromatase gene in breast tissue by zinc-finger protein, snail (SnaH).** OKUBO, T; TRUONG, TK; YU, B;

ITOH, T; ZHAO, J; GRUBE, B; ZHOU, DJ; CHEN, S // City Hope Natl Med Ctr: Cancer Res 2001 Feb 15;61(4):1338-46. ([11245431](#))

Loss of E-cadherin expression in melanoma cells involves up-regulation of the transcriptional repressor Snail. POSER, I; DOMINGUEZ, D; DE HERREROS, AG; VARNAI, A; BUETTNER, R; BOSSERHOFF, AK // Rhein Westfal TH Aachen & Univ Pompeu Fabra: J Biol Chem 2001 Jul 6;276(27):24661-6. ([11323412](#))

The transcription factor snail controls epithelial-mesenchymal transitions by repressing E-cadherin expression. CANO, A; PEREZ-MORENO, MA; RODRIGO, I; LOCASCIO, A; BLANCO, MJ; DEL BARRIO, MG; PORTILLO, F; NIETO, MA // CSIC & Univ Autonoma Madrid: Nat Cell Biol 2000 Feb;2(2):76-83. ([10655586](#))

The transcription factor snail is a repressor of E-cadherin gene expression in epithelial tumour cells. BATLLE, E; SANCHEZ, E; FRANCI, C; DOMINGUEZ, D; MONFAR, M; BAULIDA, J; DE HERREROS, AG // Univ Pompeu Fabra: Nat Cell Biol 2000 Feb;2(2):84-9. ([10655587](#))

Identification and characterization of human SNAIL3 (SNAI3) gene in silico. KATOH, M; KATOH, M // M&M Med BioInformat & Natl Canc Ctr: Int J Mol Med 2003 Mar;11(3):383-8. ([12579345](#))

**Uncurated
References**

Identification and analysis of two snail genes in the pufferfish (Fugu rubripes) and mapping of human SNA to 20q SMITH, S; METCALFE, JA; ELGAR, G // Open Univ & UK Human Genome Mapping Project: 2000; GENE 247(1-2) p.119-128 ([ISI link](#))

Differentiation elicits negative regulation of human beta-galactoside alpha 2,6-sialyltransferase at the mRNA level in the HL-60 cell line TANIGUCHI, A; HIGAI, K; HASEGAWA, Y; UTSUMI, K; MATSUMOTO, K // Toho Univ: 1998; FEBS LETTERS 441(2) p.191-194 ([ISI link](#))

Conserved and divergent roles for members of the Snail family of transcription factors in the chick and mouse embryo SEFTON, M; SANCHEZ, S; NIETO, MA // CSIC: 1998; DEVELOPMENT 125(16) p.3111-3121 ([ISI link](#))

Interaction of a Swi3 homolog with Sth1 provides evidence for a Swi/Snf-related complex with an essential function in Saccharomyces cerevisiae TREICH, I; CARLSON, M // COLUMBIA UNIV: 1997; MOLECULAR AND CELLULAR BIOLOGY 17(4) p.1768-1775 ([ISI link](#))

Drosophila CBP is required for dorsal-dependent twist gene expression AKIMARU, H; HOU, DX; ISHII, S // RIKEN: 1997; NATURE GENETICS 17(2) p.211-214 ([ISI link](#))

Human colon-cancer cell-lines permanently expressing alpha-2,6-sialylated sugar chains by transfection with rat beta-galactoside alpha-2,6 sialyltransferase cDNA
DALLOLIO, F; CHIRICOLO, M; LOLLINI, P; LAU, JTY // ROSWELL PK CANC INST & UNIV BOLOGNA: 1995; BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS 211(2) p.554-561 ([ISI link](#))

The expression of a zebrafish gene homologous to drosophila-snail suggests a conserved function in invertebrate and vertebrate gastrulation
HAMMERSCHMIDT, M; NUSSLEINVOLHARD, C // MAX PLANCK INST ENTWICKLUNGSBIOL: 1993; DEVELOPMENT 119(4) p.1107-1118 ([ISI link](#))

Regulation of aromatase expression in human ovarian surface epithelial cells
OKUBO, T; MOK, SC; CHEN, S // City Hope Natl Med Ctr & Harvard Univ: 2000; JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM 85(12) p.4889-4899 ([ISI link](#))

Protein synthesis-dependent and -independent regulation of hippocampal synapses by brain-derived neurotrophic factor
TARTAGLIA, N; DU, J; TYLER, WJ; NEALE, E; POZZO-MILLER, L; LU, B // Howard Hughes Med Inst Natl Inst Hlth Res Scholar & NICHD & Univ Alabama: 2001; JOURNAL OF BIOLOGICAL CHEMISTRY 276(40) p.37585-37593 ([ISI link](#))

The mouse snail gene encodes a key regulator of the epithelial-mesenchymal transition
CARVER, EA; JIANG, RL; LAN, Y; ORAM, KF; GRIDLEY, T // Jackson Lab: 2001; MOLECULAR AND CELLULAR BIOLOGY 21(23) p.8184-8188 ([ISI link](#))

Analyses of the extent of shared synteny and conserved gene orders between the genome of Fugu rubripes and human 20q
SMITH, SF; SNELL, P; GRUETZNER, F; BENCH, AJ; HAAF, T; METCALFE, JA; GREEN, AR; ELGAR, G // Max Planck Inst Mol Genet & Open Univ & United Kingdom Human Genome Mapping Project Resou & Univ Cambridge: 2002; GENOME RESEARCH 12(5) p.776-784 ([ISI link](#))

Increased invasion and matrix metalloproteinase-2 expression by Snail-induced mesenchymal transition in squamous cell carcinomas
YOKOYAMA, K; KAMATA, N; FUJIMOTO, R; TSUTSUMI, S; TOMONARI, M; TAKI, M; HOSOKAWA, H; NAGAYAMA, M // Univ Tokushima: 2003; INTERNATIONAL JOURNAL OF ONCOLOGY 22(4) p.891-898 ([ISI link](#))

Transcriptional regulation of aromatase expression in human breast tissue
CHEN, S; ITOH, T; WU, KB; ZHOU, DJ; YANG, C // City Hope Natl Med Ctr: 2002; JOURNAL OF STEROID BIOCHEMISTRY AND MOLECULAR BIOLOGY 83(1-5) p.93-99 ([ISI link](#))

Biologic contribution of P1 promoter-mediated expression of ST6Gal I

sialyltransferase APPENHEIMER, MM; HUANG, RY; CHANDRASEKARAN, EV; DALZIEL, M; HU, YP; SOLOWAY, PD; WUENSCH, SA; MATTA, KL; LAU, JTY // Roswell Pk Canc Inst: 2003; GLYCOBIOLOGY 13(8) p.591-600 ([ISI link](#))

Hypoxia attenuates the expression of E-cadherin via up-regulation of SNAIL in ovarian carcinoma cells IMAI, T; HORIUCHI, A; WANG, CJ; OKA, K; OHIRA, S; NIKAI, T; KONISHI, I // Shinshu Univ: 2003; AMERICAN JOURNAL OF PATHOLOGY 163(4) p.1437-1447 ([ISI link](#))

Mouse Snail family transcription repressors regulate chondrocyte, extracellular matrix, type II collagen, and aggrecan SEKI, K; FUJIMORI, T; SAVAGNER, P; HATA, A; AIKAWA, T; OGATA, N; NABESHIMA, Y; KAECHOONG, L // INSERM 0229 & Kyoto Univ & Massachusetts Gen Hosp & Tufts Univ: 2003; JOURNAL OF BIOLOGICAL CHEMISTRY 278(43) p.41862-41870 ([ISI link](#))

Expression of beta-galactoside alpha 2,6 sialyltransferase and of alpha 2,6-sialylated glycoconjugates in normal human liver, hepatocarcinoma, and cirrhosis DALL'OLIO, F; CHIRICOLO, M; D'ERRICO, A; GRUPPIONI, E; ALTIMARI, A; FIORENTINO, M; GRIGIONI, WF // Univ Bologna: 2004; GLYCOBIOLOGY 14(1) p.39-49 ([ISI link](#))

Ganglionic action of angiotensin contributes to sympathetic activity in renin-angiotensinogen transgenic mice MA, XY; SIGMUND, CD; HINGTGEN, SD; TIAN, X; DAVISSON, RL; ABOUD, FM; CHAPLEAU, MW // Univ Iowa & Vet Affairs Med Ctr: 2004; HYPERTENSION 43(2) p.312-316 ([ISI link](#))

Snail and SIP1 increase cancer invasion by upregulating MMP family in hepatocellular carcinoma cells MIYOSHI, A; KITAJIMA, Y; SUMI, K; SATO, K; HAGIWARA, A; KOGA, Y; MIYAZAKI, K // Saga Med Sch: 2004; BRITISH JOURNAL OF CANCER 90(6) p.1265-1273 ([ISI link](#))